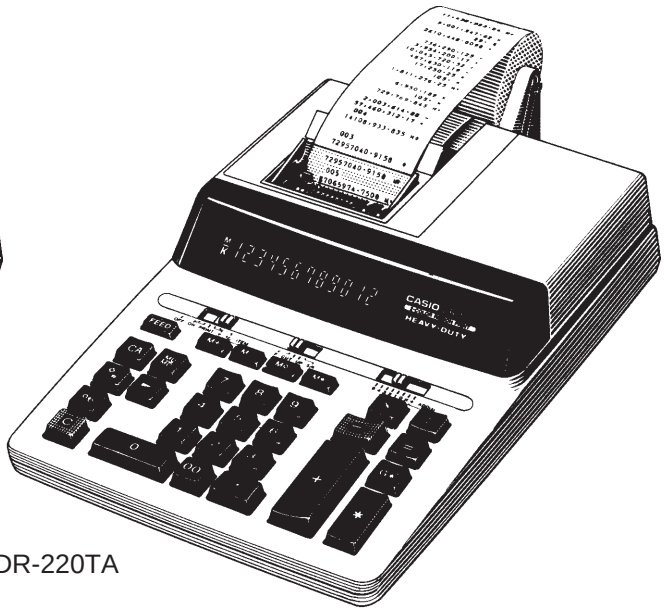
SERVICE MANUAL & PARTS LIST (without price)

DL-270B (ZX-510IY)
DR-220TA (ZX-510AY)

NOV. 1995

DL-270B



DR-220TA

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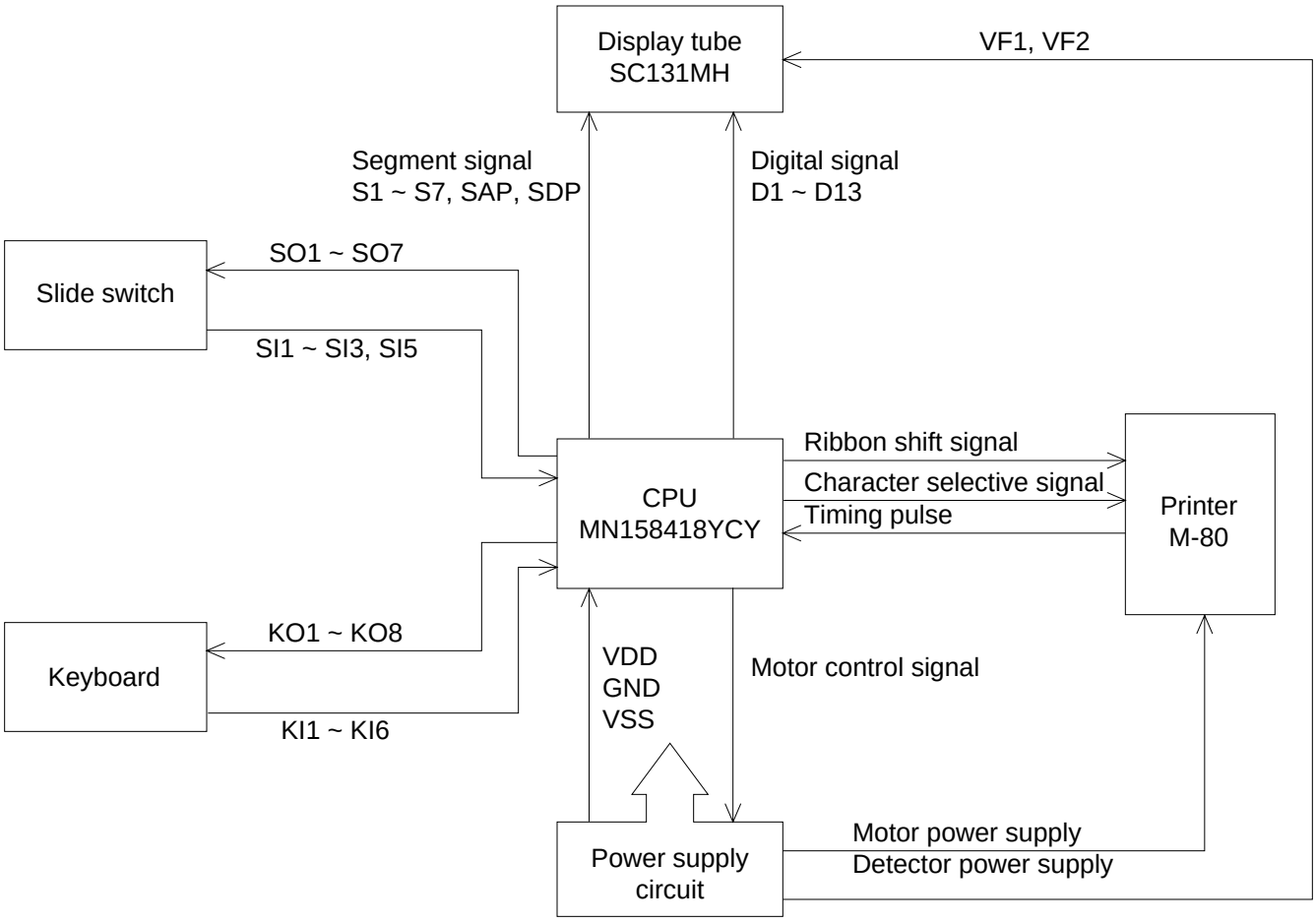
1. SPECIFICATIONS

Functions:	4 basic arithmetic operations (+, -, ×, ÷), constants for ×/÷, sub-total/total/grand total, item counting, ADD mode calculations, repeat calculations, memory calculations, percentage calculations and various kinds of practical calculations.
Decimal point:	Full floating, and fixed (0, 1, 2, 3, 4 or 6) with round-off, round-up or cut-off.
Capacity:	12 digits
Display:	Digitron tube panel
Ambient temperature range:	0°C ~ 40°C (32°F ~ 104°F)
Power supply:	AC 100/120/220 or 240 V (±10 V), 50/60 Hz ••••• Fixed *Rated current and voltage are printed on the calculator.
Dimensions:	83 mmH × 214 mmW × 376 mmD (3 1/4"H × 8 3/8"W × 14 3/4"D) including rollholder.
Weight:	1.7 kg (3.8 lbs)

2. BLOCK DIAGRAM



3. CPU (MN158418YCY) PIN FUNCTION

Pin No.	Signal	I/O	Function
1~7, 64	P00~P13	Out	Common signal for keyboard
8~12	P20~P22, P32, P33	In	Key signal from keyboard
13	IRQ	In	Timing pulse signal from printer
14	DEBIN	In	Not used
15	IRQCNT	In	VDD (33 V, 30 mA)
16	P40	Out	Motor control signal
17	P41	Out	Ribbon shift signal for printer
18~30	P42, P43, P50~P53 P70~P73, P80~P82	Out	Character selective signal for printer
31, 32	P83, P90	Out	Character selective signal for printer, Segment signal for display
33~39	P91~P93 PA0~PA3	Out	Segment signal for display, Common signal for slide switch
40	P60	Out	VDD (33 V, 30 mA)
41~43	P61~P63	In	Signal from slide switch
44~56	PB0~PB3 PC1~PC3 PD0~PD3 PE0	Out	Digit signal for display
57	VPP	—	GND terminal
58	VDD	—	VDD terminal
59, 60	OCS1, OCS2	I/O	Clock signal for CPU
61	VSS	—	VSS terminal
62	SYNC	—	Not used
63	RST	In	Signal from slide switch, Reset signal

4. TROUBLESHOOTING

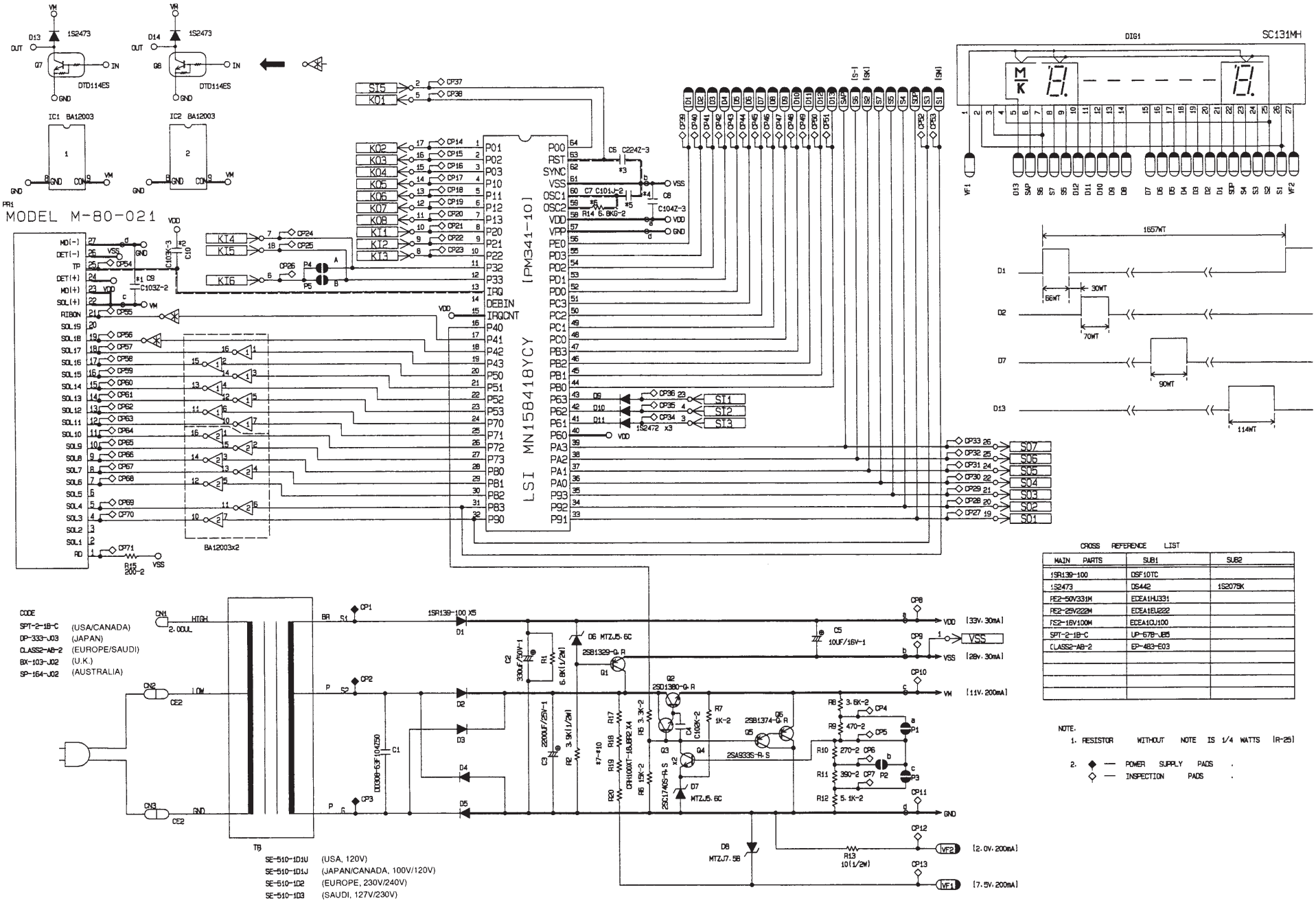
Trouble	Cause	Checkpoint	Note
1) Does not work at all.	• Defective power transformer	Secondary voltage of transformer	VDD, VSS, VM, VF1, and VF2 are OK?
	• Defective LSI	Waveforms of each pin	
2) No display.	• No voltage at VF1, VF2	VF1, VF2	
	• No digit signal or no segment signal	Signal D1 ~ S1 ~	Check the pulse signals from LSI.
	• Defective display tube		If VF1, VF2, Digit and Segment signals are OK.
3) No print.	• Poor voltage VM		VM=11V (while printing)
	• Defective motor		
4) Poor display.	• Defective LSI		
	• Short or open circuits between digit signals and segment signals.	Between LSI and display tube	
	• Defective display tube		
5) Poor printing • Motor does not stop.	• Timing signal is bad.		Check detector of printer block and timing signal.
• Missing of digits	• Defective printer magnet		
	• Refer to the printer service manual published separately.		

5. DIAGNOSTIC

STEP	MODE SWITCHES			OPERATION	DISPLAY	PRINT	NOTE
1	ON	F	6	1 00 TM	100.		
2	ON	F	6	C	0.		
3	ON	F	6	8 – ÷ 9 % ◊/#	-888.888888888	[-] [88.8888888888]	The character with "[ ]" will be printed by red ink.
4	ON	F	6	▶	-888.88888888		
5	ON	F	6	CA	0.		
6	PRINT	F	6	1 2 3 4 ÷	1234.	1.234 • ÷	
7	PRINT	F	6	7 6 5 +	1.61307189542	765 • = 1.61307189542+	
8	PRINT	CUT	6	M+	M 1.613071	1.613071 M+	
9	PRINT	CUT	4	M+	M 1.6131	1.6131 M+	
10	PRINT	UP	3	M–	M 1.614	[1.614 M+]	
11	PRINT	UP	2	÷ 5 MU/MD	M 1.54	1.614 ÷ 5 • %M 0.08 -% 1.54	
12	PRINT	5/4	1	+	M 3.1	1.5 +	
13	PRINT	5/4	0	+	M 5.	2 • +	
14	PRINT	5/4	ADDX	M◊	1.613	1.613 M◊	
15	PRINT	5/4	ADDX	M❊	1.613	1.613 M*	
16	PRINT	5/4	ADDX	CA 1 ÷ ÷ 1 =	K 0.01	• • 0 • • 1 • ÷ 1• K÷ 0 • 01 ÷ 1 • = 0 • 01	
17	PRINT	5/4	ADD+	X 1 – 1 –	-0.02	0 • 01 X [- 1 • =] [- 0 • 01+] [0 • 01-]	
18	PRINT	5/4	ADD+	◊/#	-0.02	[0 • 01 -] [- 0 • 02◊]	
19	ITEM+	5/4	ADD+	◊/#	-0.02	002 [- 0 • 02◊]	
20	ITEM+/–	5/4	ADD+	– ❊	-0.03	[0 • 01 -] 001 [- 0 • 03 ❊]	
21	ITEM+/–	5/4	ADD+	G	-0.03	001 [- 0 • 03G❊]	
23	ITEM+/–	5/4	ADD+	FEED		Paper feeding	Press the button 2 or 3 seconds continuously.
24	ITEM+/–	5/4	ADD+	AC	0.	• • 0 • •	

6. SCHEMATIC DIAGRAMS

6-1. Main Board



CODE

SPT-2-1B-C	(USA/CANADA)
DP-333-J03	(JAPAN)
CLASS2-AB-2	(EUROPE/SAUDI)
BX-103-J02	(U.K.)
SP-164-J02	(AUSTRALIA)

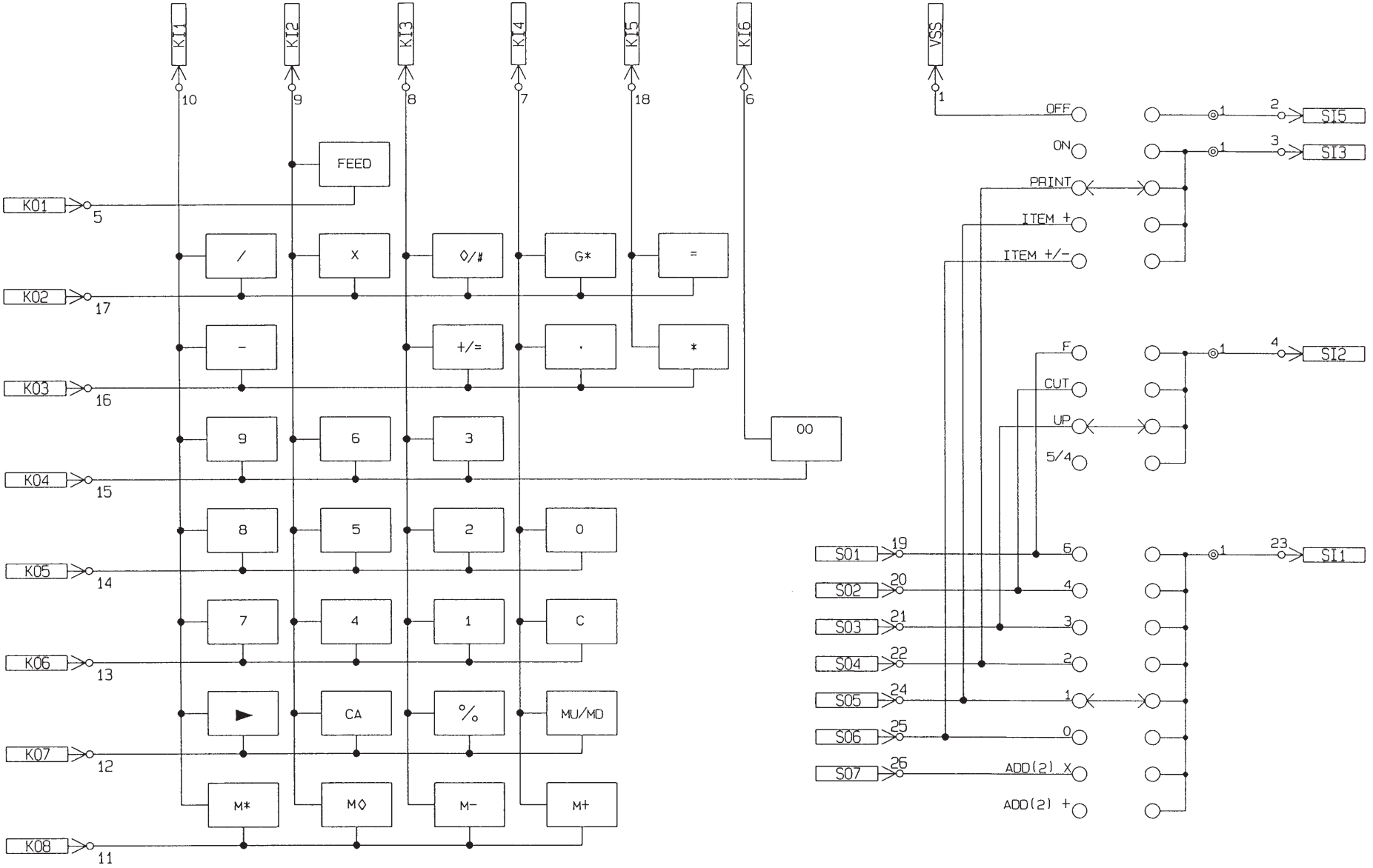
CROSS REFERENCE LIST

MAIN PARTS	SUB1	SUB2
1SR139-100	DSF10TC	
1S2473	DS442	1S2075K
RE2-50V331M	ECEA1HU331	
RE2-25V222M	ECEA1EU222	
RS2-16V100M	ECEA1CJ100	
SPT-2-1B-C	UP-678-J85	
CLASS2-AB-2	EP-483-E03	

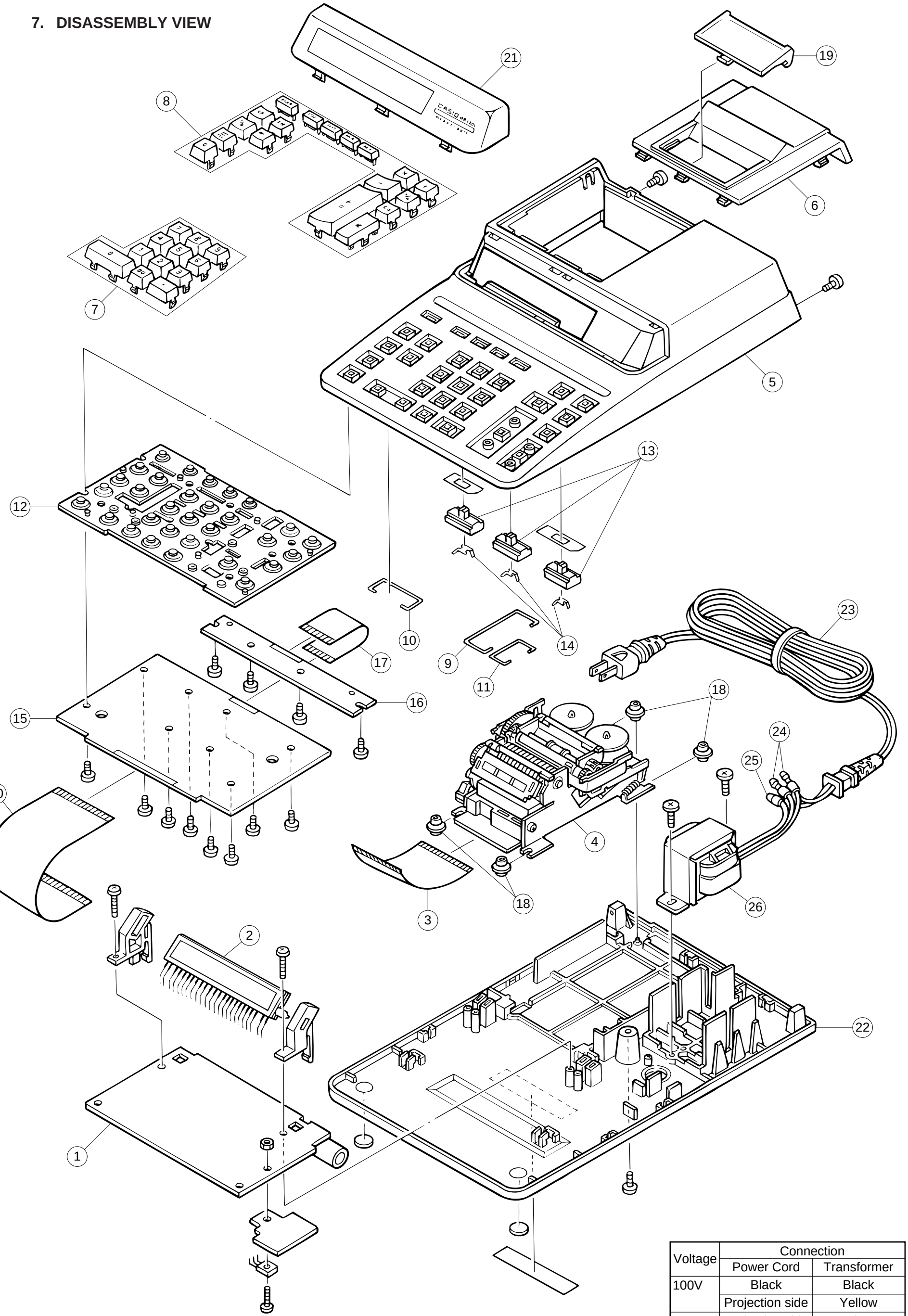
NOTE.

1. RESISTOR WITHOUT NOTE IS 1/4 WATTS (R-25)
2. ◆ — POWER SUPPLY PADS .
   ◇ — INSPECTION PADS .

6-2. Key Matrix



7. DISASSEMBLY VIEW



Voltage	Connection	
	Power Cord	Transformer
100V	Black	Black
	Projection side	Yellow
120V	Projection side	Blue
	Marking side	Black
220V	Brown	Black
	Blue	White
240V	Brown	Black
	Blue	Red

8. PARTS LIST

N	Item	Code No.	Parts Name	Specification	Q'ty A	Q'ty B	M	R
		PCB Z510-1 ASS'Y						
	LSI	2012 1295	LSI	MN158418YCY	1	1	1	B
	IC1, 2	2114 2436	Mos IC	BA12003	2	2	5	B
	Q1	2251 0525	Transistor	2SB1329-Q,R	1	1	10	B
	Q3, 4	2252 0896	Transistor	2SC1740S-R,S	2	2	20	B
	Q5	2250 0672	Transistor	2SA933S-R,S	1	1	20	B
	Q6	2251 0581	Transistor	2SB1374-Q,R	1	1	10	B
	Q7, 8	2259 1449	Digital transistor	DTD114ES	2	2	20	B
	D1 ~ 5	2390 0378	Diode	1SR139-100T-32-T	5	5	20	C
	D6,7	2360 1946	Zener diode	MTZJ5.6CT-77-T	3	3	20	C
	D8	2360 2016	Zener diode	MTZJ7.5BT-77-T	1	1	20	C
	D9 ~ 11	2301 0054	Diode	1S2472-T-77-T	3	3	20	C
	D13, 14	2301 0101	Diode	1S2473-T-77-T	2	2	20	C
		The following elecrical parts will be not supplied from CASIO.						
	C1, 8		Semiconductive capacitor	0.1uF, 50V, +20/-80%	2	2		
	C2		Electrolytic capacitor	330uF, 50V	1	1		
	C4		Ceramic capacitor	1pF, 50V, ±10%	1	1		
	C5		Electrolytic capacitor	10uF, 16V	1	1		
	C6		Semiconductive capacitor	0.22uF, 12V, +20/-80%	1	1		
	C7		Ceramic capacitor	10pF, 50V, ±5%	1	1		
	C9, 10		Ceramic capacitor	0.01uF, 50V, +20/-80%	2	2		
	R1		Carbon film resistor	6.8Kohm, 1/2W, ±5%	1	1		
	R2		Carbon film resistor	3.9Kohm, 1/2W, ±5%	1	1		
	R5		Carbon film resistor	3.3Kohm, 1/4W, ±5%	1	1		
	R6		Carbon film resistor	15Kohm, 1/4W, ±5%	1	1		
	R7		Carbon film resistor	1Kohm, 1/4W, ±5%	1	1		
	R8		Carbon film resistor	3.6Kohm, 1/4W, ±5%	1	1		
	R9		Carbon film resistor	470ohm, 1/4W, ±5%	1	1		
	R10		Carbon film resistor	270ohm, 1/4W, ±5%	1	1		
	R11		Carbon film resistor	390ohm, 1/4W, ±5%	1	1		
	R12		Carbon film resistor	5.1Kohm, 1/4W, ±5%	1	1		
	R13		Carbon film resistor	10ohm, 1/2W, ±5%	1	1		
	R14		Carbon film resistor	6.8Kohm, 1/4W, ±2%	1	1		
	R15		Carbon film resistor	200ohm, 1/4W, ±5%	1	1		
	R17 ~ 20		Metal film resistor	8.2ohm, 1W, ±5%	4	4		
N	1	6416 0540	PCB Z510-1 Ass'y	P140018*1	1	1		B
			(This ass'y contains the above parts as its element.)					
		PCB UNIT						
N	1	6416 0540	PCB Z510-1 Ass'y	P140018*1	1	1	1	B
	2	3301 0385	Display tube	SC131MH	1	1	1	A
	3	6053 7440	PC joiner B-V298	P310141-4	1	1	5	C
	4	1014 8290	Digital printer	M-80-021	1	1	1	A
	C3	2803 8199	Electrolytic capacitor	RE2-25V222M-T50	1	1	5	C

Notes:
N – New parts
M – Minimum order/supply quantity
R – Rank
Q – Quantity used per unit

R – A : Essential
B : Stock recommended
C : Others
X : No stock recommended

A : DR-220TA
B : DL-270B

N	Item	Code No.	Parts Name	Specification	Q'ty A	Q'ty B	M	R
	Q2	2253 0469	Transistor	2SD1380-QR	1	1	5	C
		COMPONENTS						
N	5	6416 0563	Upper case Z510AYL	P110062C-10	1	0	1	X
N	5	6416 0633	Upper case Z510IYU	P110062C-11	0	1	1	X
	6	6054 1260	Printer cover L220C	P210183-4	1	1	1	C
	7	6052 3060	Ten key ass'y	P210078*1	0	1	1	C
	7	6052 6500	Ten key ass'y	P310139*1	1	0	1	C
	8	6052 6541	Function key ass'y	P310140A*2	0	1	1	C
	8	6052 6530	Function key ass'y	P310140*1	1	0	1	C
	9	6052 6620	Hang A-V282	P410126-2	1	1	1	X
	10	6052 6630	Hang B-V282	P410117-2	1	1	1	X
	11	6052 6640	Hang C-V282	P410127-2	1	1	1	X
	12	6052 6550	Key rubber V282	P210161-1	1	1	1	C
	13	6052 6560	Switch knob V282	P310084-3	3	3	1	C
	14	6051 4240	Switch spring V270	P41543-1	3	3	10	C
	15	4311 6470	PCB-L220-E4 (Keyboard)	P210354-1	1	1	1	B
	16	4311 6480	PCB-L220-E3 (Switchboard)	P210353-1	1	1	1	B
	17	6054 1040	PC joiner C-L220	P310141-6	1	1	10	C
	18	6389 3307	Printer cushion	M4K3791	4	4	10	X
	19	6054 0920	Paper cutter L220	P3714-4	1	1	1	B
	20	6054 0950	PC joiner A-L220	P310141-5	1	1	10	B
	21	6055 0460	Display plate L222	P210450-1	1	1	1	C
	22	6054 1601	Lower case L220C	P110144A-3	1	1	1	X
	23	3701 0308	Power cord (USA/CANADA)	SPT-2-1B-C	1	1	1	C
	23	3701 0329	Power cord (Europe)	CLASS2-AB-2	1	0	1	C
	24	5530 0526	Terminal connector	CE2	2	2	10	X
	25	3680 1131	Terminal cap	2.0DUL	1	1	10	X
N	26	3012 1372	Power transformer	SE-510-1D1J	1	1	1	B
N	26	3012 1379	Power transformer	SE-510-1D1U	0	1	1	B
N	26	3012 1365	Power transformer	SE-510-1D2	1	0	1	B
		OTHERS						
		6052 7460	Roll arm L-V282	P310091-3	1	1	10	A
		6052 7470	Roll arm R-V282	P310092-3	1	1	10	A
		Parts prices will be informed separately by Parts Price List.						

Notes:
N – New parts
M – Minimum order/supply quantity
R – Rank
Q – Quantity used per unit

R – A : Essential
B : Stock recommended
C : Others
X : No stock recommended

A : DR-220TA
B : DL-270B

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